WHAT IS CLAIMED IS:

1. A method for energy-aware software control of a display in a computer system so as to reduce energy consumed by the display, comprising:

profiling screen usage patterns and their impact on energy consumption by the display, the profiling resulting in an energy model;

determining when to prompt the energy-aware software control of the display in order to decrease its energy consumption;

determining which screen portions of the display and what display parameters to control based on the energy model; and

for each portion of the display to be controlled, controlling its display parameters, wherein the screen portions are controlled to attain energy conservation.

2. The method of claim 1, wherein the computer system is a mobile computing system.

3. The method of claim 1, wherein the energy-aware software control provides the control at a pixel-level of display granularity.

4. The method of claim 1, wherein the energy-aware software control provides the control at a tile-level grid-level or frame-level of display granularity.

5. The method of claim 1, wherein the screen portions are controlled to dim their illumination relative to a screen area of focus which is highlighted, a dimming range being provided to accommodate user preferences and render the energy-aware software control less intrusive on a user experience.

6. The method of claim 1, wherein the controlled display parameters include a refresh rate the values of which being limited to a range that is provided to accommodate user preferences and render the energy-aware software control less intrusive on a user experience, the refresh rate of the screen portions being controlled within that range.

7. The method of claim 1, wherein the energy-aware software control is functioning at a particular level of the computing environment in the computer system, that level being an operating system level, an applications level, a firmware level, or, if the computing environment is a windowing environment, a windows manager level, or any combination thereof.

8. The method of claim 1, wherein the energy model is created on the basis of profiling parameters, the energy model being a static and/or a dynamic model of screen usage patterns.

9. The method of claim 1, wherein the energy model identifies screen usage patterns of typical applications that run in the computer system.

10. The method of claim 1, wherein if the computer system has a computing environment that is windows-based the energy model can include an average screen area used by a window of focus, an average screen area used by other windows, and a level of minimum brightness to which a screen area can be brought.

11. The method of claim 1, wherein the energy model contains data including areas of the screen that do not require full use of the display functionality for long time periods.

12. The method of claim 1, wherein an area of focus on the screen that remains highlighted relative to the screen portions that are controlled consumes higher energy than these screen portions, and wherein the area of focus is determined on the basis of

heuristics derived from parameters in the energy model,

user or application-controlled indications as to which screen areas are outside of the area of focus, or

dynamic observations of the parameters from the energy model.

13. The method of claim 12, wherein the heuristics can vary with the applications.

14. The method of claim 12, wherein the heuristics can be embodied in the applications.

15. The method of claim 12, wherein, in a windows-based environment of the computer, system the area of focus can be correlated to a window of interest.

16. The method of claim 12, wherein the area of focus can be correlated to a frame-of focus.

17. The method of claim 12, wherein the area of focus can be correlated to a cursor position, or an icon.

18. The method of claim 1, wherein the controlled display parameters are any energy-consuming parameters including one or a combination of intensity, refresh rate, gray scale and color.

19. The method of claim 1, wherein, by controlling the screen portions to attain the energy conservation, the controlling being characterized in that only screen areas of interest are highlighted, the energy-aware software control is associated with reduced amounts of computations required for image processing in producing a screen.

19. The method of claim 1, wherein the energy-aware software control is prompted to provide either automatic control of the display based on monitored metrics or user-initiated control.

20. The method of claim 19, wherein the monitored metrics include battery current.

21. The method of claim 1, wherein the energy-aware software control can be turned on or off by a user of the computer system.

22. The method of claim 1, wherein the screen portions are controlled at a pixel-levels of display granularity, and wherein each pixel to be controlled is so marked.

23. The method of claim 1, wherein controlled display parameters corresponding to the screen portions can reach a threshold or round-off level.

24. The method of claim 23, wherein the threshold or round-off levels are set so as avoid an impact that is intrusive on a user experience.

25. The method of claim 22, wherein a pixel is marked based on a comparison between required or measured level of its display parameters and a maximum level of its display parameters, such that if the required or measured level is lower than the maximum level the pixel is a candidate for control.

26. A system for energy-aware software control of a display in a computer system so as to reduce energy consumed by the display, comprising:

means for profiling screen usage patterns and their impact on energy consumption by the display, the profiling resulting in an energy model;

means for determining when to prompt the energy-aware software control of the display in order to decrease its energy consumption;

means for determining which screen portions of the display and what display parameters to control based on the energy model; and

for each portion of the display to be controlled, mans for controlling its display parameters, wherein the screen portions are controlled to attain energy conservation.

27. A system for energy-aware software control in a computer system, comprising:

a display capable of supporting control of individual portions thereof so at to reduce energy consumed by the display; and

an energy-aware software control product, in a computer readable medium, embodying program code including instructions to cause the computer to perform steps, including

profiling screen usage patterns and their impact on energy consumption by the display, the profiling resulting in an energy model;

determining when to prompt the energy-aware software control of the display in order to decrease its energy consumption;

determining which screen portions of the display and what display parameters to control based on the energy model; and

for each portion of the display to be controlled, controlling its display parameters, wherein the screen portions are controlled to attain energy conservation.

28. The system of claim 27, wherein the display is configured with a display technology which is one of an organic light emitting diode (OLED) technology, liquid crystal display (LCD) technology, inorganic electroluminescent (EL) display technology, field emission display technology and CRT technology, each of which being capable of supporting the energy-aware software control at a fine level of granularity corresponding to elements of the individual portions of the display.

29. The system of claim 28, wherein the fine level of granularity is a tile, grid, matrix or pixel.

30. A system for energy-aware software control in a computer system, comprising:

a central processing unit (CPU);

a memory embodying program code to be fetched and executed by the CPU, the program code including that of applications;

a display capable of supporting fine-grained control of screen portions via their respective display parameters;

a user interface, the display and user interface being directly or indirectly controlled by the CPU;

a monitor configured to monitor power metrics of a computer system power source;

an energy model creator using as an input profiling parameters to create an energy model; and

an energy-aware software control means capable of controlling the respective display parameters of the screen portions based on the energy model, wherein the energy-aware software means is prompted based on indications from the monitor, applications and/or user interface.

31. The system of claim 28, wherein the power source is a battery and the power metrics include battery current, and wherein monitoring the battery current allows automatic prompting of the energy-aware software control.

32. The system of claim 28, further comprising:

means for allowing a user to turn the energy-aware software control on/off via the user interface.